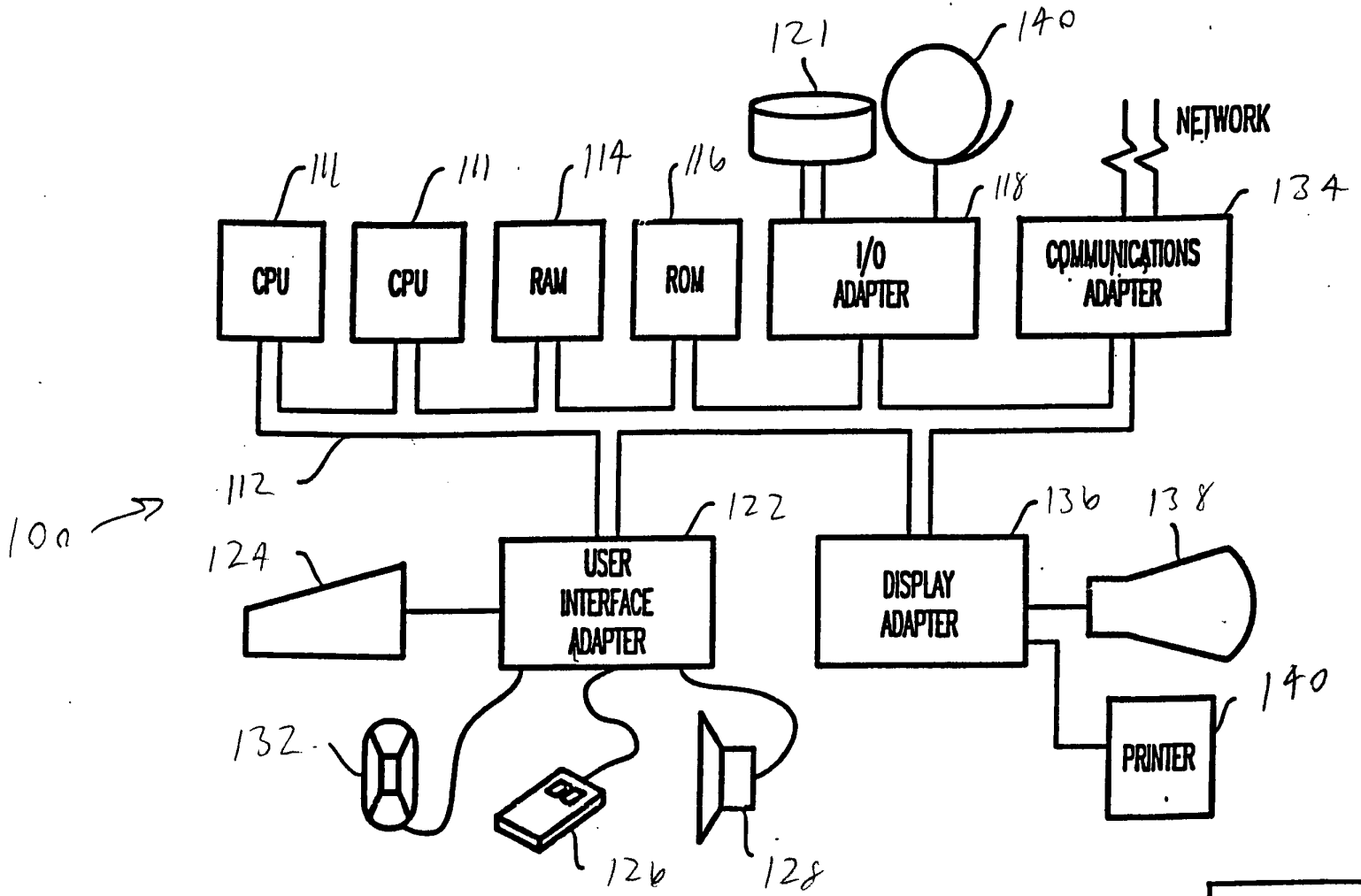

121
140
NETWORK
111
111
114
116
118
134
CPU
CPU
RAM
ROM
I/O ADAPTER
COMMUNICATIONS ADAPTER
112
10a
122
136
138
124
USER INTERFACE ADAPTER
DISPLAY ADAPTER
140
PRINTER
132
126
128

FIG. 1

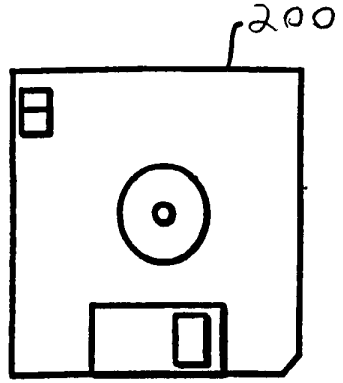

200

FIG. 2

```
<PurchaseOrder>
    <Buyer>
        <Name>John Smith</Name>
    </Buyer>
    <LineItems>
        <Item>
            <Name>ThinkPad T20</Name>
            <Description>
             This laptop is the <Bold>best value</Bold> in its class
            </Description>
            <:Price>$1999</Price>
        </Item>
        <Item>
            <Name>NetVista Desktop</Name>
            <:Price>$999</Price>
        </Item>
    </LineItems>
</PurchaseOrder>
```

Figure 3

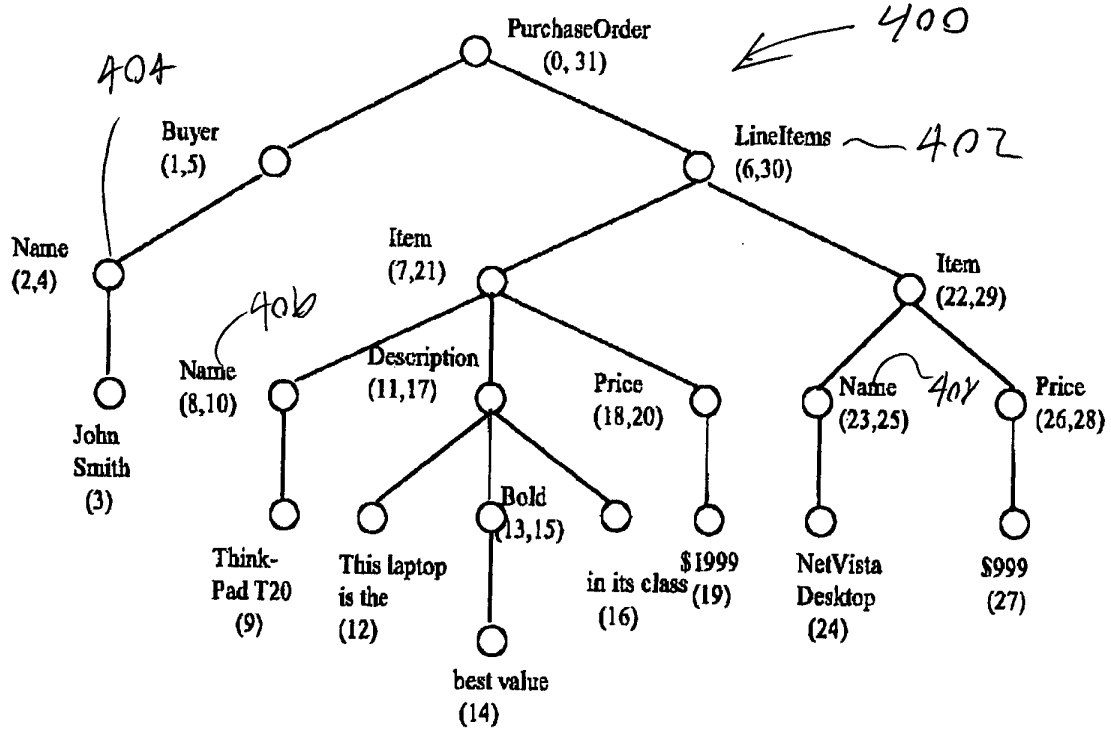
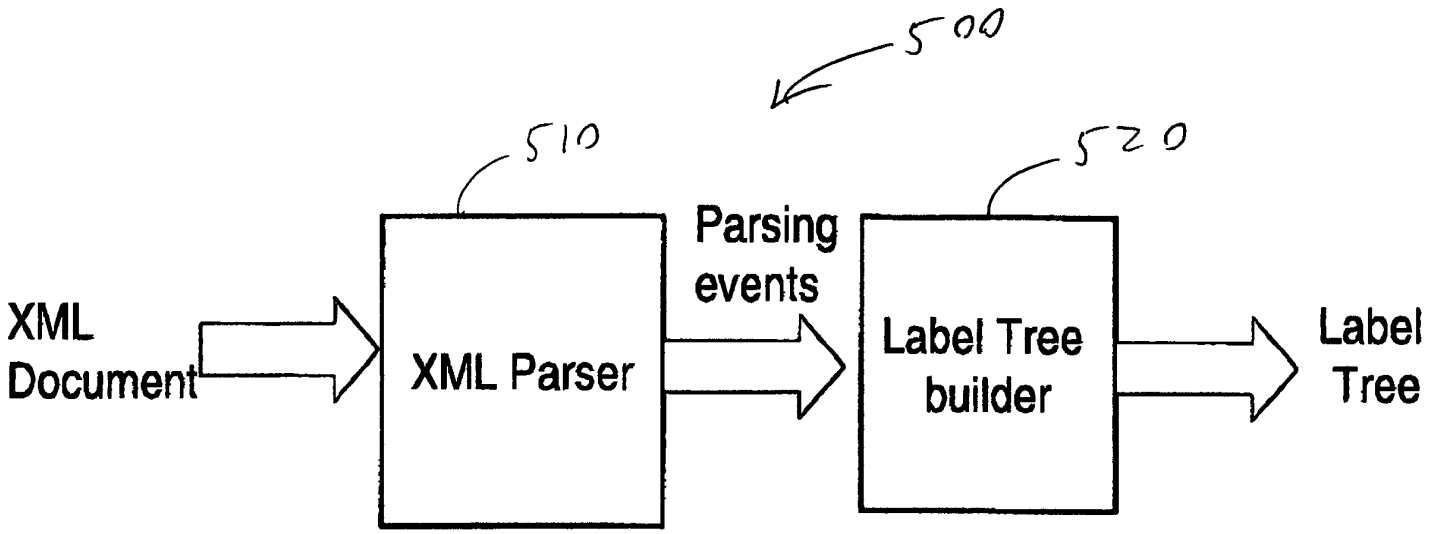
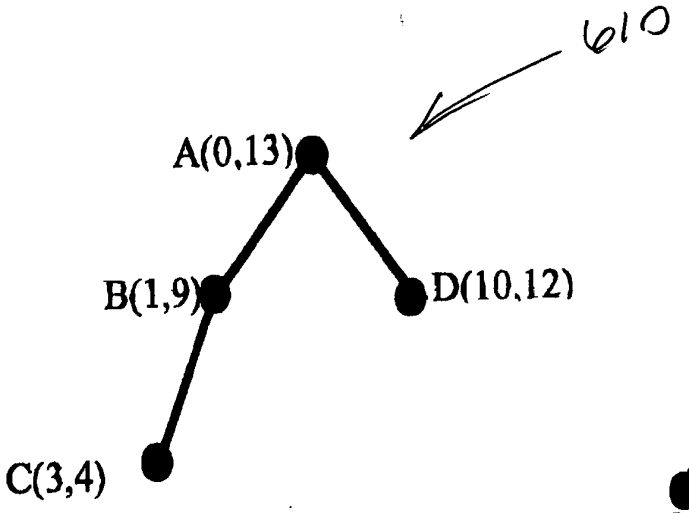

PurchaseOrder
(0, 31)
400
404
Buyer
(1,5)
LineItems
(6,30)
402
Name
(2,4)
Item
(7,21)
Item
(22,29)
406
Name
(8,10)
Description
(11,17)
Price
(18,20)
Name
(23,25)
407
Price
(26,28)
John
Smith
(3)
Bold
(13,15)
Think-
Pad T20
(9)
This laptop
is the
(12)
in its class
(16)
$1999
(19)
NetVista
Desktop
(24)
$999
(27)
best value
(14)

FIG. 4



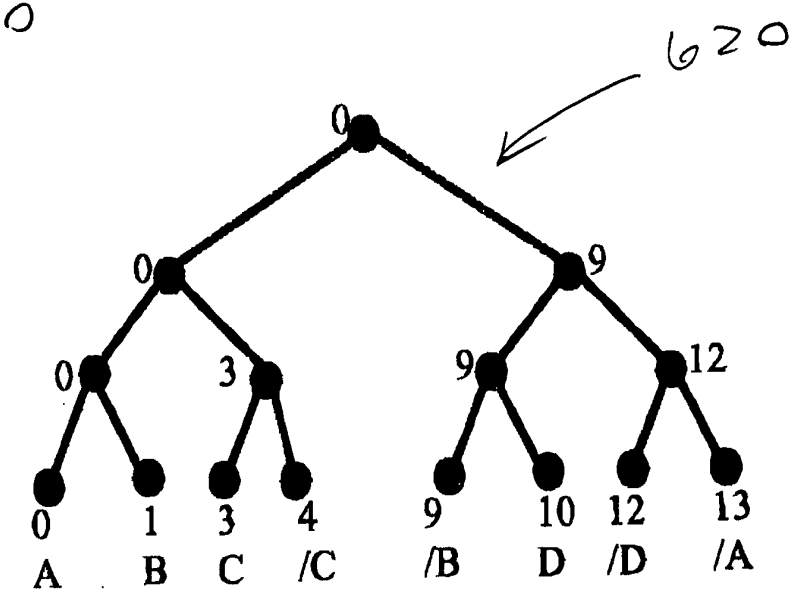
Building the label tree in bulk-loading mode

FIG. 5



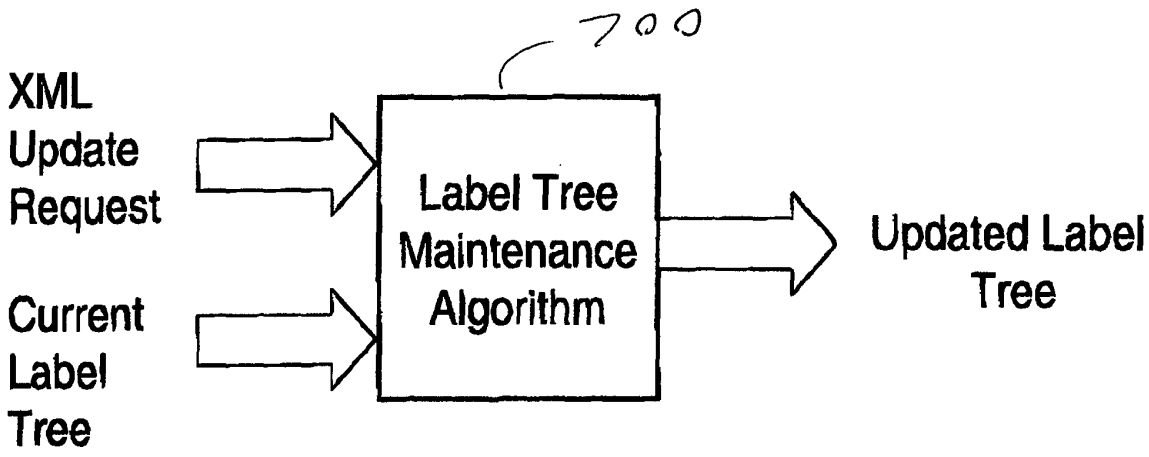
XML tree

FIG. 6A



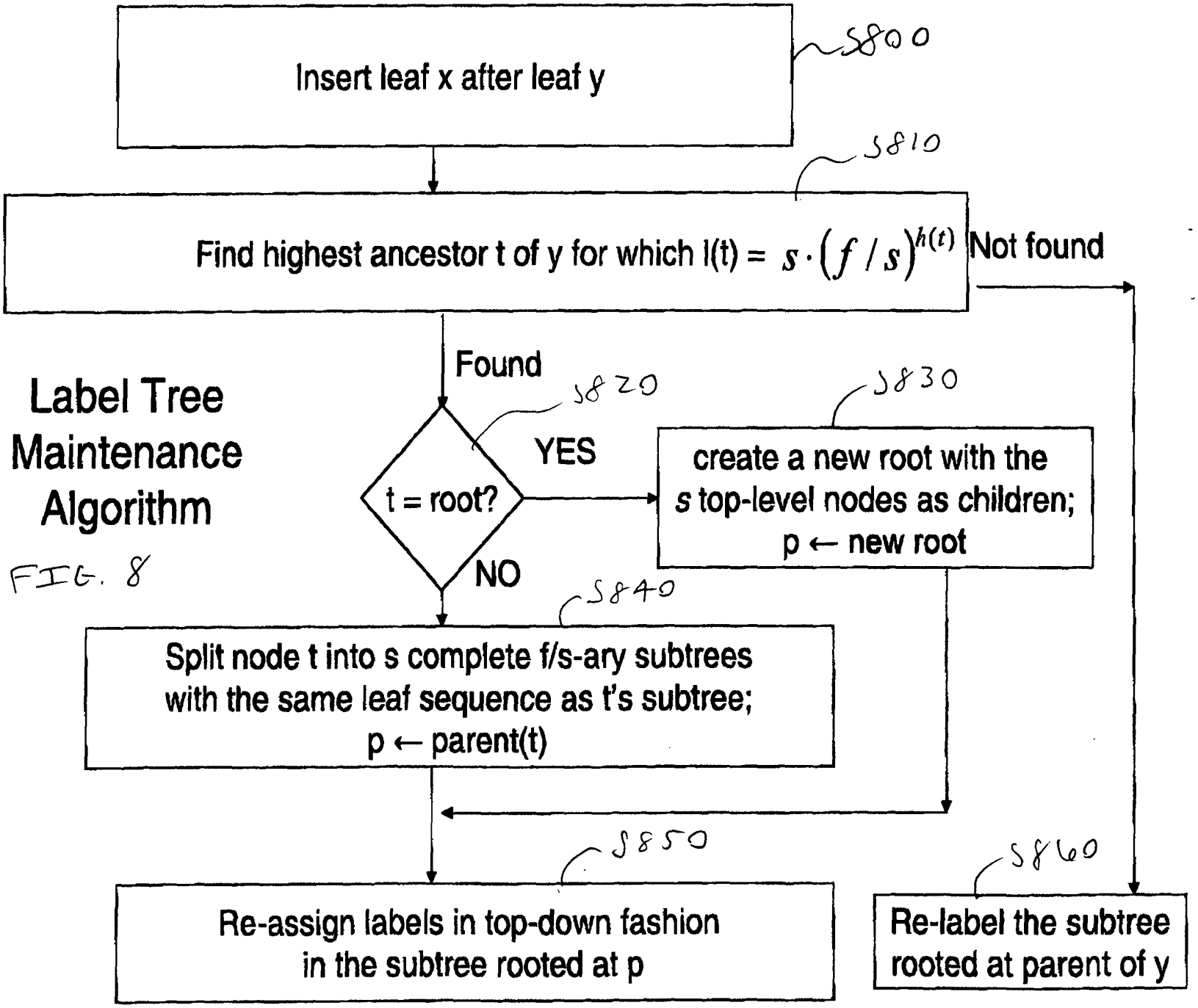
Label tree (f=4,s=2)

FIG. 6B



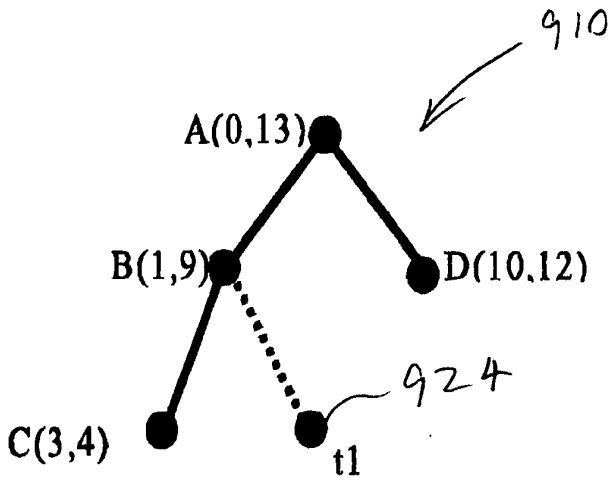
Maintaining the label tree in response to updates

FIG. 7



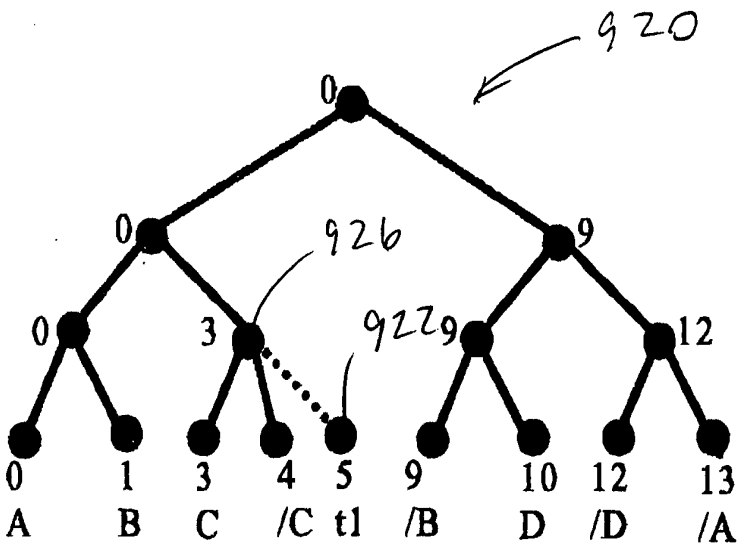
Label Tree Maintenance Algorithm

FIG. 8



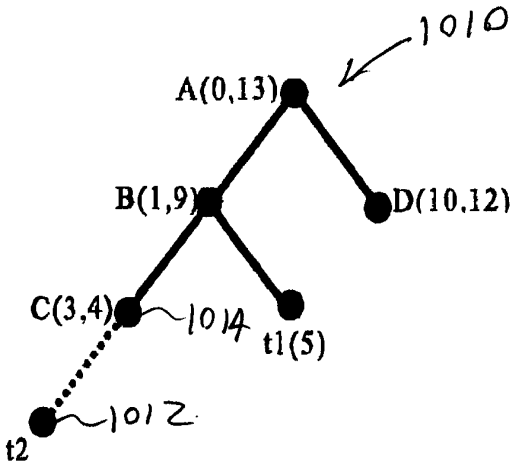
XML tree

FIG 9A



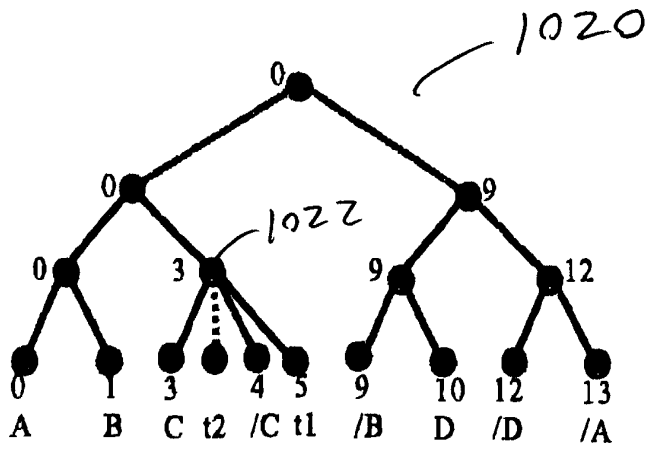
Label tree (f=4,s=2)

FIG 9B



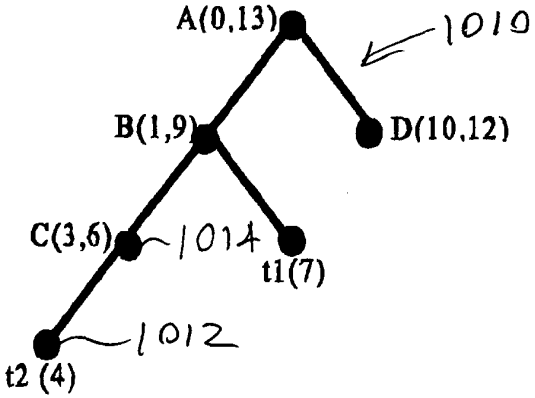
XML tree (before insertion)

FIG. 10A



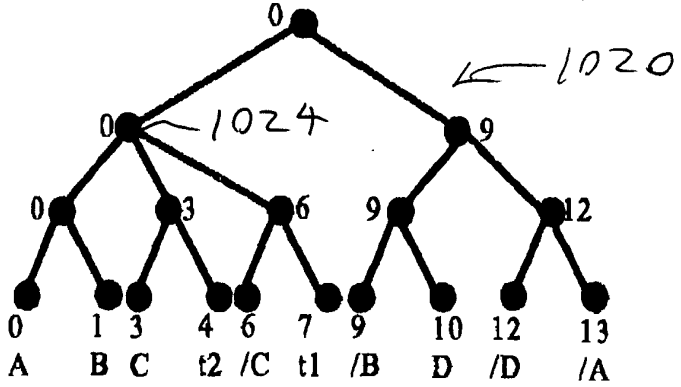
Label tree (f=4,s=2)
(before insertion)

FIG. 10B



XML tree (after insertion)

FIG. 10C



Label tree (f=4,s=2)
(after insertion)

FIG. 10D

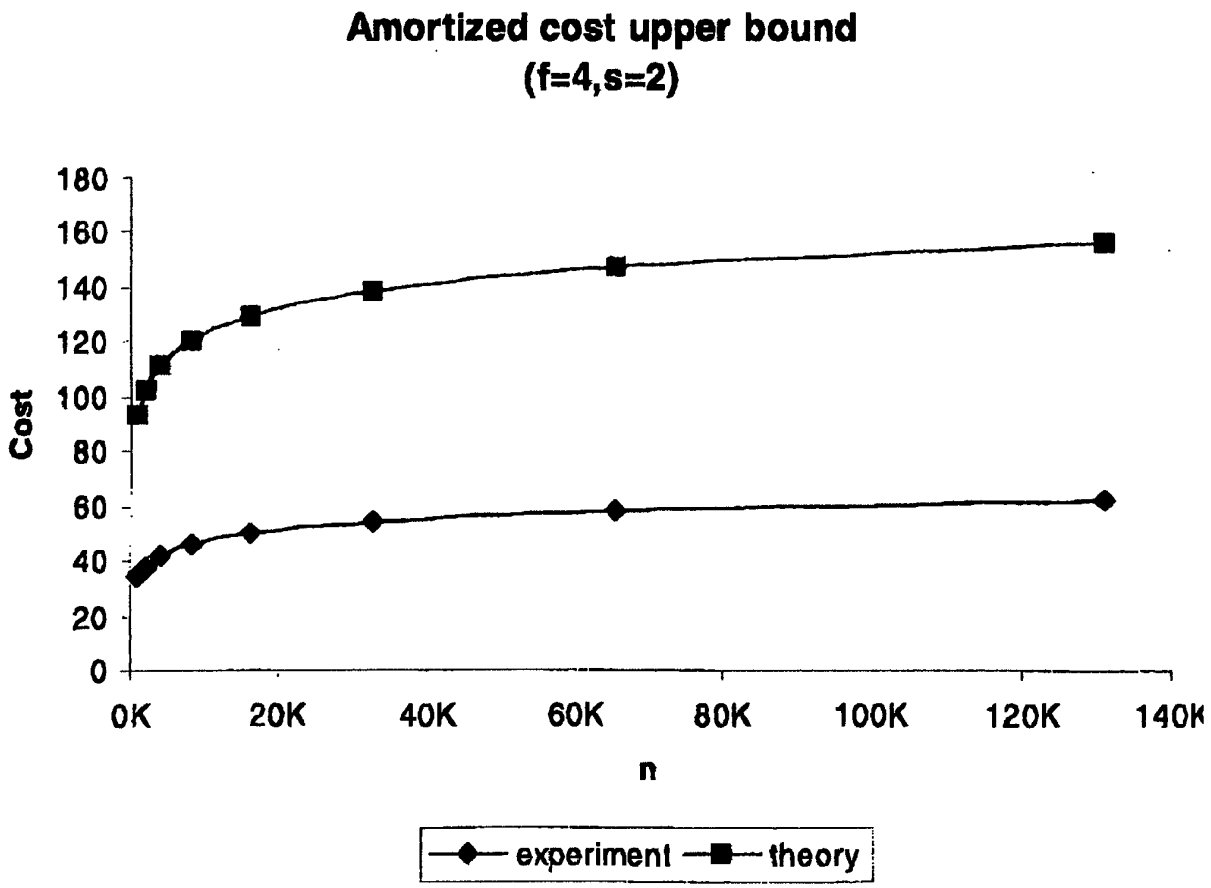

Amortized cost upper bound
(f=4,s=2)
Cost
180
160
140
120
100
80
60
40
20
0
0K
20K
40K
60K
80K
100K
120K
140K
n
experiment
theory

FIG. 11

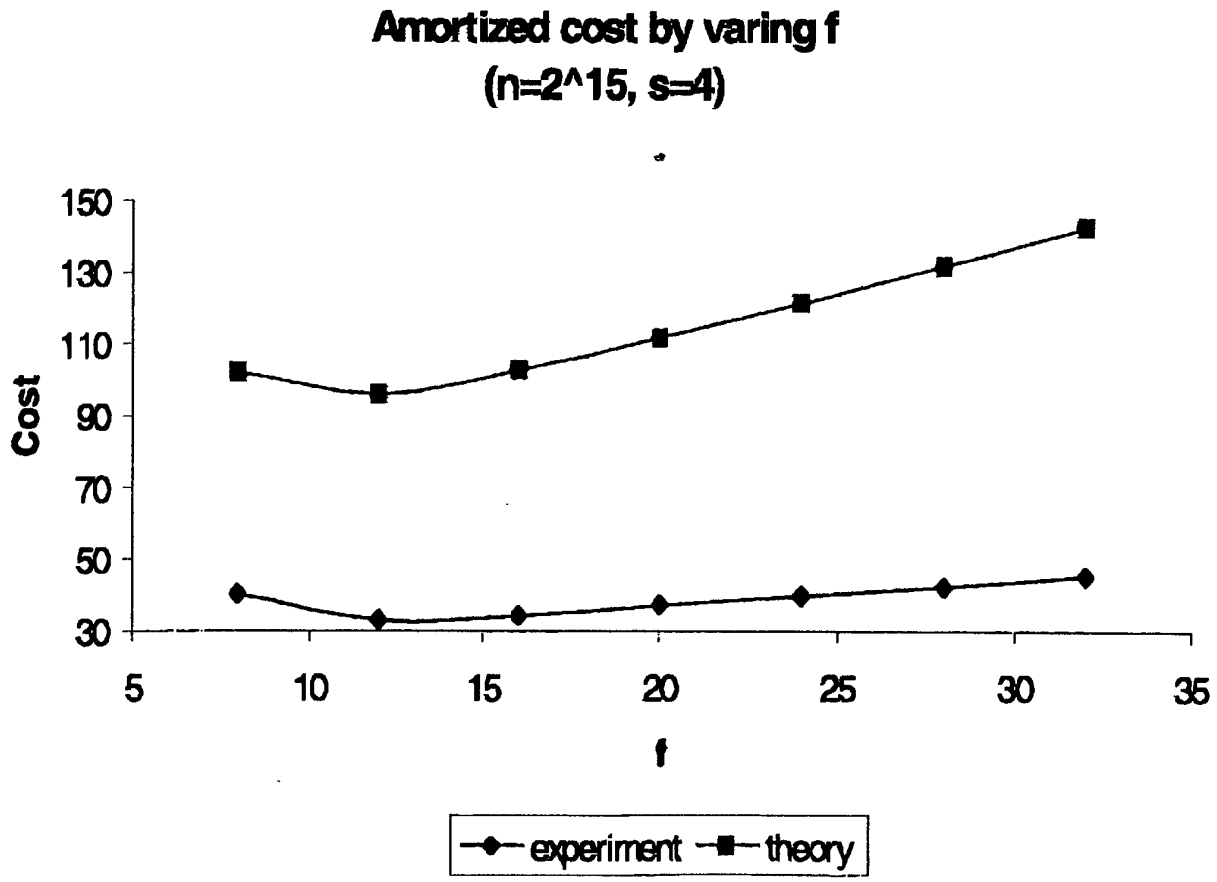

Amortized cost by varing f
(n=2^15, s=4)
Cost
150
130
110
90
70
50
30
5
10
15
20
25
30
35
f
experiment
theory

FIG. 12

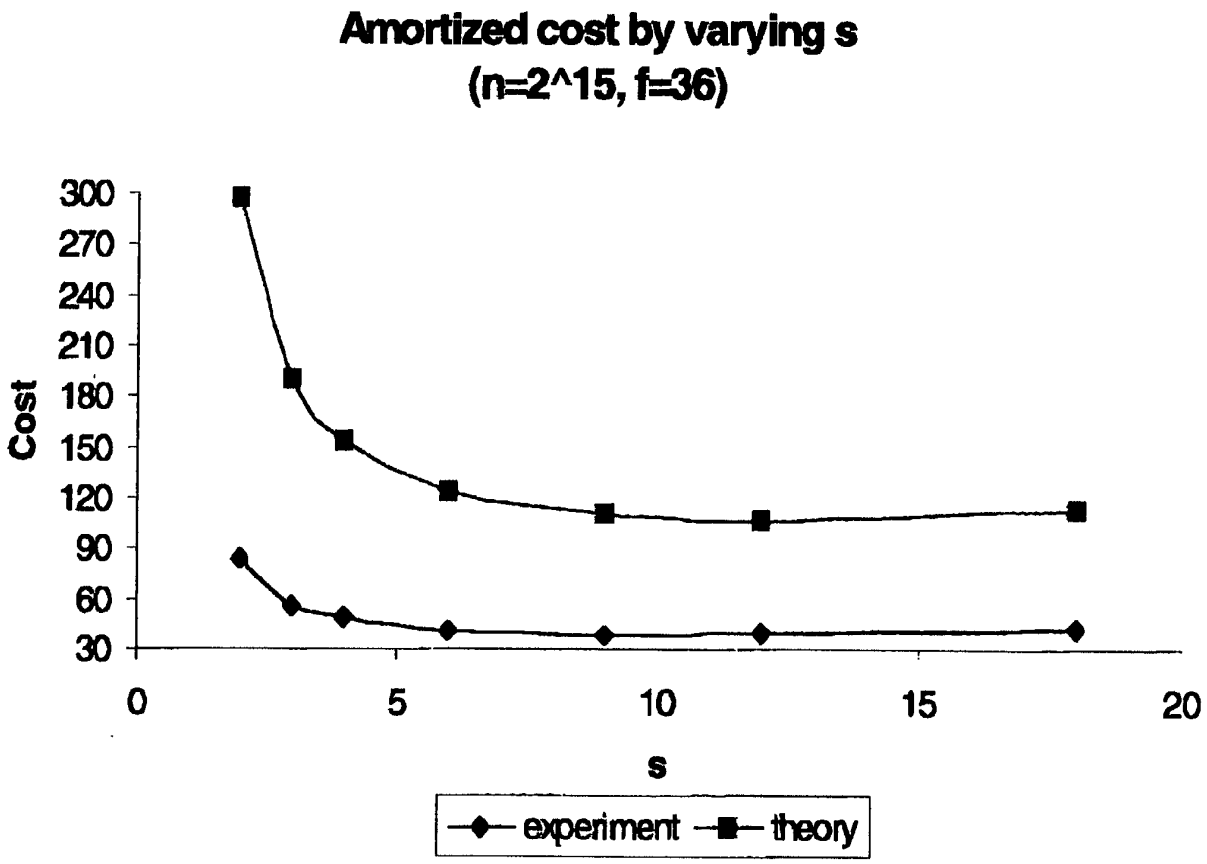

Amortized cost by varying s
(n=2^15, f=36)
Cost
300
270
240
210
180
150
120
90
60
30
0
5
10
15
20
s
experiment
theory

FIG. 13

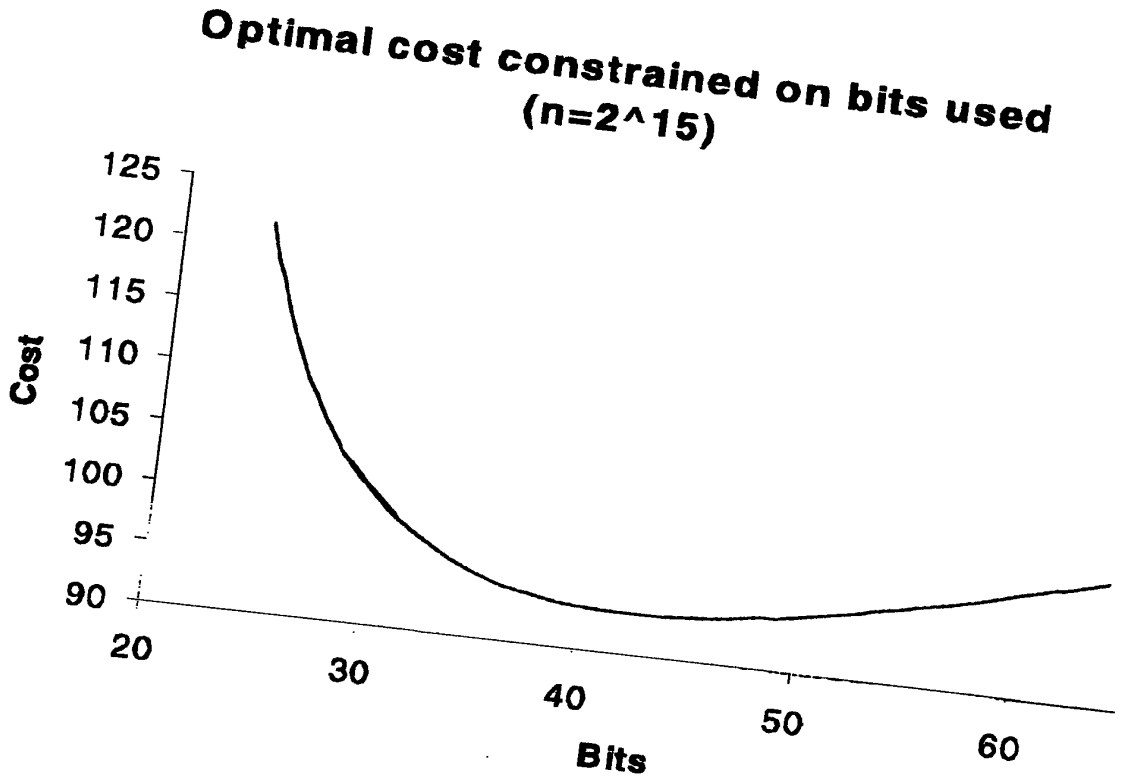

Optimal cost constrained on bits used
(n=2^15)
Cost
125
120
115
110
105
100
95
90
20
30
40
50
60
Bits

FIG. 14